CLAIMS:

1. A sensor head, comprising:

a three-dimensional base body having a curved surface allowing definition of a circular orbital band;

an electroacoustic transducer arranged on the orbital band of the three-dimensional base body, configured to excite surface acoustic wave to perform multiple roundtrips along the orbital band; and

a sensitive film at least a part of which is formed on at least a part of the orbital band of the three-dimensional base body, configured to react with a specific gas molecule.

2. The sensor head of claim 1, wherein the orbital band is defined on the surface of the outer periphery of the three-dimensional base body.

3. The sensor head of claim 1, wherein the orbital band is defined on the interior face of a cavity of the three-dimensional base body.

4. The sensor head of claim 1, wherein the thickness of the sensitive film is 100 nanometers or less.

5. The sensor head of claim 1, wherein the thickness of the sensitive film is one five hundredth of the wavelength of the surface acoustic wave or less.

6. The sensor head of claim 1, wherein the thickness of the sensitive film is one thousandth of the wavelength of the surface acoustic wave or less.

7. The sensor head of claim 1, wherein the sensitive film is a film containing palladium.

8. The sensor head of claim 1 further comprising a temperature sensor on the surface of the three-dimensional base body configured to measure the surface temperature.

9. The sensor head of claim 8, wherein the temperature sensor includes a resistance-detection pattern provided on at least a part of the orbital band.

10. A gas sensor, comprising:

a three-dimensional base body having a curved surface allowing definition of a circular orbital band;

an electroacoustic transducer arranged on the orbital band of the three-dimensional base body, configured to excite surface acoustic wave to perform multiple roundtrips along the orbital band and generate a high frequency electric signal from the surface acoustic wave being experienced the multiple roundtrips;

a sensitive film at least a part of which is formed on at least a part of the orbital band of the three-dimensional base body and configured to react with a specific gas molecule;

a high frequency generator configured to feed a high frequency electric signal to the electroacoustic transducer; and

a detection/ output unit configured to measure the high frequency electric signal pertaining to propagation characteristic of the surface acoustic wave from the electroacoustic transducer.

11. The gas sensor of claim 10, wherein the high frequency generator and the detection/ output unit are integrated onto the three-dimensional base body.

12. The gas sensor of claim 10 further comprising a temperature sensor on the surface of the three-dimensional base body configured to measure the surface temperature.

13. The gas sensor of claim 12, wherein the temperature sensor includes a resistance-detection pattern delineated on at least a part of the orbital band.

14. A sensor unit, comprising:

a three-dimensional base body having a curved surface allowing

definition of a circular orbital band;

an electroacoustic transducer arranged on the orbital band of the three-dimensional substrate and excite surface acoustic wave to perform multiple roundtrips along the orbital band and generate a high frequency electric signal from the surface acoustic wave being experienced the multiple roundtrips;

a sensitive film at least a part of which is formed on at least a part of the orbital band of the three-dimensional base body and configured to react with a specific gas molecule;

a packaging board on which the three-dimensional base body is mounted;

a high frequency generator arranged on the packaging board and to feed a high frequency electric signal to the electroacoustic transducer;

a detection/ output unit arranged on the packaging board and measure the high frequency electric signal pertaining to the propagation characteristics of the surface acoustic wave from the electroacoustic transducer;

a first board wiring arranged on the surface of the packaging board and be electrically connected to the high frequency generator;

a second board wiring arranged on the surface of the packaging board and be electrically connected to the detection/ output unit; and

conductive connectors configured to electrically connect the first and the second board wiring to the electroacoustic transducer, respectively.

15. The sensor unit of claim 14 further comprising a temperature sensor on the surface of the three-dimensional base body configured to measure the

surface temperature.

16. The sensor unit of claim 15, wherein the temperature sensor includes a resistance-detection pattern delineated on at least a part of the orbital band.

17. A sensor unit, comprising:

a three-dimensional base body having a curved surface allowing definition of a circular orbital band;

an electroacoustic transducer arranged on the orbital band of the three-dimensional substrate and excite surface acoustic wave to perform multiple roundtrips along the orbital band and generate a high frequency electric signal from the surface acoustic wave being experienced the multiple roundtrips;

a sensitive film at least a part of which is formed on at least a part of the orbital band of the three-dimensional base body and configured to react with a specific gas molecule;

a high frequency generator configured to be integrated on the three-dimensional base body and to feed a high frequency electric signal to the electroacoustic transducer;

a detection/ output unit integrated on the three-dimensional base body and configured to measure the high frequency electric signal pertaining to the propagation characteristics of the surface acoustic wave from the electroacoustic transducer;

a packaging board on which the three-dimensional base body is

mounted;

a board wiring arranged on the surface of the packaging board; and

a conductive connector configured to electrically connect the first interconnect to the detection/ output unit.

18. The sensor unit of claim 17 further comprising a temperature sensor on the surface of the three-dimensional base body configured to measure the surface temperature.

19. The sensor unit of claim 18, wherein the temperature sensor includes a resistance-detection pattern delineated on at least a part of the orbital band.